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ABSTRACT

On May 18, 1983 a conference was held at the Northwest Regional Educational Laboratory (NWREL) to discuss the status of work on cost analysis studies in education at the state and local level. NWREL, local and state education agencies in Oregon and Washington, and two Portland area universities were represented at the conference. Jana Kay Smith presented a report which reviewed cost studies conducted at NWREL from 1978 to 1982. The report assessed the current practice of cost analysis in education and proposed a system to help determine the cost needs of a client requesting a cost study. Larry Picus had conducted the majority of cost studies reviewed in Smith's report and shared his experiences with applications of cost analysis methods in educational settings. Members of a panel which consisted of local and state education agency and NWREL staff discussed prospects for cost analysis methods in their agencies. All panel members (Don Egge, Walt Hathaway, Zeno Katterle, and Robert Rath) were known for their interest in the area of cost analysis and for their experience in the conduct of such studies. A transcript of the conference proceedings (major presentations and audience discussion) is included. (PN)

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paper and report series

No. 63 PROCEEDINGS OF THE SEMINAR "COST ANALYSIS IN EDUCATIONAL EVALUATION", HELD IN TEL AVIV

JUNE/JULY 1978, EDITOR

Research Evaluation Program

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No. 87 PROCEEDINGS OF THE SEMINAR
"COST ANALYSIS IN EDUCATIONAL
EVALUATION: WHERE TO FROM HERE"

JANA KAY SMITH, EDITOR

July 1983

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PREFACE

The Research on Evaluation Program is a Northwest Regional Educational Laboratory project of research, development, testing, and training designed to create new evaluation methodologies for use in education. This document is one of a series of papers and reports produced by program staff, visiting scholars, adjunct scholars, and project collaborators--all members of a cooperative network of colleagues working on the development of new methodologies.

What cost analysis work is currently being done in schools and state departments? Is cost-effectiveness analysis a truly pragmatic alternative method for doing educational program evaluations? These and related questions are addressed in this report which contains a transcript of a conference held to discuss the practice, problems, and potential of doing educational cost studies. Representatives of a regional laboratory, a state department of education, and two school districts recount their own experiences and provide unique perspectives on the potential utility of educational cost analysis studies.

Nick L. Smith, Editor
Paper and Report Series

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Jana Kay Smith

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INTRODUCTION

On May 18, 1983 a conference was held at NWREL to discuss the status of work on cost analysis studies in education at the state and local level. The conference was based on a report completed recently by Jana Kay Smith entitled "Case Reports of Northwest Regional Educational Laboratory Cost Studies" which examined 16 educational cost studies conducted by NWREL staff. Earlier work by Henry M. Levin had identified four predominant methods of cost analysis in educational evaluation: cost-benefit, cost-effectiveness, cost-utility, and cost-feasibility. Because Smith had not found applications of these methods, one reason for the conference was to try to learn if these four methods of cost analysis were being employed by state and local education evaluators. The conference also presented an opportunity to (a) review Smith's report, (b) discuss the problems of doing cost studies, and (c) explore the future of cost analyses in educational evaluation.

Twenty-two people attended the conference, including representatives from NWREL, local and state education agencies in Oregon and Washington, as well as two Portland area universities. The following presenters were invited to participate:

The first featured speaker was Jana Kay Smith, a visiting scholar with the Research on Evaluation Program. Jana presented her recently completed report which reviewed cost studies conducted at the Northwest Regional Educational Laboratory (NWREL) from 1978 to 1982. The report assessed the current practice of cost analysis in education and proposed a system to help determine the cost needs of a client requesting a cost study.

The second featured speaker was Larry Picus, an economist with the Center for State Studies of NWREL. Larry had conducted the majority of cost studies reviewed in Smith's report and shared his experiences with applications of cost analysis methods in educational settings.

Finally, members of a panel which consisted of local and state education agency and NWREL staff discussed prospects for cost analysis methods in their agencies. All panel members were known for their interest in the area of cost analysis and for their experience in the conduct of such studies. Panel members included: Don Egge, Oregon State Department of Education; Walt Hathaway, Portland Public Schools; Zeno Katterle, Beaverton School District; and Robert Rath, NWREL.

The rest of this document contains a transcript of the conference proceedings, including major presentations and audience discussion. Its purpose is to (a) make available the ideas shared by the presenters, (b) stimulate debate on the feasibility of conducting cost analyses in educational evaluation, and (c) provide a practical perspective on past, present, and future application of cost analyses at local and state levels.

Jana Kay Smith

I have already shared with you copies of my report entitled, Case Reports of Northwest Regional Educational Laboratory Cost Studies. The purpose of the study described in it was to document the state of practice of cost studies in educational settings. The way that we did this was, first of all, to identify projects that had taken place; second, to abstract from the written reports the procedures that were used in the projects; and finally, to conclude with interviews with the principal investigators to get subjective information on investigator and client satisfaction, information on utilization, and so on.

I identified 15 cost studies that fell into four categories. If you refer to Table 1 in your reports, you'll see that within category one I found five projects (See Table 1). These projects consisted of cost comparisons between two or more programs or entities. In category two there were three projects that described the costs of a single program or entity. In category three, budgets and planning, there were three studies, all of which looked at budgeting or planning issues. And, finally, there were four reports in the category I called policy analysis.

I was quite surprised when I tried to categorize these reports. I expected that the reports would fall into Levin's four cost categories: cost-effectiveness, cost-benefit, cost-feasibility, and cost-utility. However, when I tried to fit the reports into those those categories, I couldn't. So I went back to the studies for a second look at them to see what factors had led to the types of methods that were used, and whether or not alternative cost-analysis methods could have been possible.

During the second review, I did find some cases where alternative cost analyses were possible. For example, I didn't classify Cases 1, 2, and 3 as cost-feasibility analyses, although in some sense they could be interpreted as such. Cost

Table 1

Category	Case	Report Title	Client	Year	Budget	Time in Months	Number Pages
1	1	District Ownership vs. Contracting for Pupil Transportation Services: An Analysis	LEA	1980	5,000	2	62
	1a	District Ownership vs. Contracting for Pupil Transportation Services: Update	LEA	1982	5,000	1	53
	2	Final Report and Recommendations: Lake Stevens Area Transportation Cooperative Feasibility Study	SEA, LEA	1979	16,000	5	102
	3	Final Report and Recommendations: Yelm Area School Bus Cooperative Feasibility Study	SEA, LEA	1979	24,000	9	69
	4	Hawaii Secondary Analysis * (cost represents less than 5% of this major study)	SEA	1982	300,000	36	78
	5	An Analysis of the Costs of Student Activity Programs: Final Report	LEA	1981	5,000	3	101
2	6	The Education of Special Populations in the Northwest and Hawaii: A Regional Depiction Study	CSSO	1982	9,000	3	82
	7	The Education of Southeast Asian Refugee Students in the Northwest and Hawaii	LEA	1981	13,500	3	64
	8	Adopter's Guides					
3	9	State Expenditure Analysis: Highlights	CSSO	1980	7,500	3	36
	10	Montana Foundation Study: Final Report	SEA	1978	75,000	13	350
	11	Cost Factors and Fund Allocation in Oregon Migrant Education Programs	SEA	1982	NA	NA	17
4	12	The Elementary and Secondary Education Consolidation Act of 1981: SEA Policy Options	CSSO	1981	5,000	3	18
	13	California and Proposition 13: A Brief Analysis	CSSO	1979	1,666	.6	8
	14	A Brief Analysis of the Implementation of Idaho's 1% Initiative	CSSO	1979	1,666	.6	9
	15	Why Property Tax Limitations Won't Limit Everyone's Taxes	CSSO	1979	1,666	.6	5

LEA = Local Education Agency
SEA = State Education Agency
CSSO = Chief State School Officers
NA = Not Available

feasibility analysis tabulates the costs for a given program or programs and compares those costs to a ceiling limit. In other words, is it feasible within our economic structure to support this program? Cases 1, 2, and 3 were not considered to be cost-feasibility methods, because there was no explicit mention of upper limits, or points beyond which an alternative was no longer economically feasible.

Another alternative analysis that I thought was possible for these three studies was cost-effectiveness. Cost-effectiveness analysis forms a ratio between the cost of the program and a non-monetary effectiveness measure, such as test scores. I didn't consider Cases 1, 2, and 3 to be cost-effectiveness studies, because there was no mention of the effectiveness of the alternatives, although it was assumed by the principal investigator that each alternative provided the same quality of transportation. In this sense, effectiveness was assumed to be equal across all alternatives and was not taken explicitly into account. It could be argued, therefore, that the effectiveness component of the cost-effectiveness ratio was equivalent and so dropped out, leaving the cost figures to stand alone.

At first I thought that such an assumption was inappropriate. Since then, I've been doing more research in the literature, and repeatedly found instances of the same assumption. One report that Nick Smith and I ran across reviewed 14 studies assessing the cost-effectiveness of home health care versus hospital health care. All of the reviewed studies assumed that the alternative care programs achieved the same outcome. Although the title of those articles implied a cost-effectiveness analysis of home health care programs, when you looked at the studies, there were no measures of effectiveness. Effectiveness was assumed to be equivalent across programs and was dropped out of the cost-effectiveness ratio.

In Case 4, the Hawaii Secondary Analysis, cost was a minor but interesting part of the study. This study was intended to provide a prescriptive model for utilization of existing data. What I found in the report was that cost data were readily

available, and effectiveness data were very available, and yet there was no attempt to put these two together. When I talked about this with the principal investigator, however, a rationale for not combining the effectiveness and cost data was provided. There was no way to insure that the programs were uniformly implemented across schools, so it would have been inappropriate to pool the data and form cost-effectiveness ratios.

In this case, it was correct not to use cost-effectiveness analysis. However, if the report was prescriptive in order to provide a model for evaluation, why not encourage an attempt to insure uniformity of implementation across schools, so that you could then combine the cost and effectiveness data into a ratio?

I also felt that in Cases 6 and 7 (although I may not be entirely correct in this) there could have been a potential for a cost-effectiveness analysis. These were federally implemented programs, where I felt that there were most probably some measures of effectiveness available which could have been compared to the program costs.

Finally, Case 8 refers to Adopter's Guides produced by the Lab which are designed to provide three perspectives on implementation of a program: (1) how to develop a program, (2) how to determine the costs of developing and running it, and (3) how to measure its effectiveness. In the Adopter's Guides that I looked at, there was no mention, even though there were models provided for evaluation, of the possibility of combining the cost data with the effectiveness data. This seemed to be an omission that could be easily corrected. In these situations, given that the guides were prescriptive, I felt cost-effectiveness methods could have been suggested.

The question I have is, "Why, when the data were available in some cases, and readily available in others, weren't these more sophisticated cost analyses done?" Was there not an interest in the relationship of cost to effects? If you will refer to Figure 1, I developed a flow chart in order to understand better why particular cost methods were chosen.

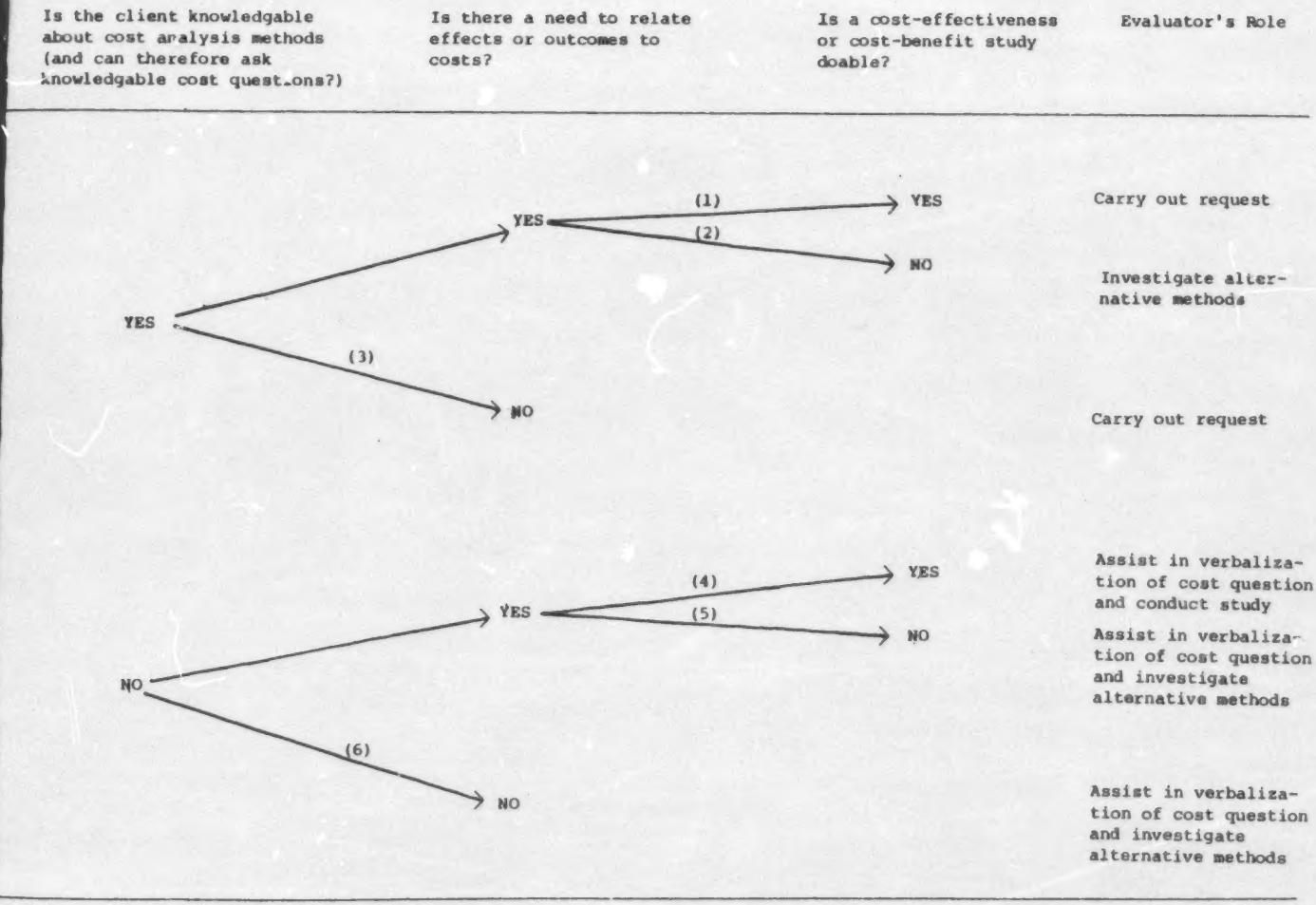

Figure 1: Factors affecting the choice of a cost analysis method.

First, I wondered why people don't ask about cost-effectiveness, or ask questions of a more sophisticated nature. It may be that the clients don't know that they can ask these questions; or they don't know to say that they want to see how cost relates to effects. That could be one reason.

Second, it could be that there is no reason to relate cost to effects. In that case, cost-effectiveness or cost-benefit analyses would be inappropriate: you would be giving more to your client than would be necessary, or than they would use.

A third possibility, and the one that is of most interest to me, is whether or not it's feasible to do a cost-effectiveness study. In the cases I reviewed, it seemed that it was very feasible; the data were already available! However, I have frequently heard, and we may hear about this from our panel members, that usually it's simply too difficult to get the data you need for a cost-effectiveness study. Comparative programs are not in existence. You can't get uniform measures across programs, and so on. It will be interesting to hear other people's perspectives on that. I won't run through Figure 1 because I think it's self explanatory. Basically, in the figure what I do is follow through the various alternatives I just mentioned and suggest the appropriate role for the evaluator, whether it be to carry out the request of the client, to educate the client on cost-analysis methods, or to suggest alternative methods.

Finally, in the report, I looked at implications for future cost studies. People seem not to know about cost-effectiveness analysis; perhaps we need to educate clients about the information they can learn from their data about their programs. Conversely, it may be that there is actually not that much interest in, or need to, relate cost to effect. In this case, we should be developing methods that measure cost-feasibility or budgeting. Finally, it may be that cost-effectiveness analyses are simply not "doable" or feasible for educational evaluation. Again, in this case, perhaps we should be promoting cost methods that are more reasonable or "doable."

Levin has proposed four cost-analysis methods: cost-effectiveness, cost-benefit, cost-feasibility, cost-utility, and has promoted them as being the primary methods of cost analysis. That is not what I found. Perhaps we need to investigate other cost-analysis methods. Hopefully, the perspectives of our panel members will help clarify this issue, and will project for us the need for the different types of methods. In addition, it will be interesting to hear about the successes that they've had with these methods, and techniques that they've used in the past.

Audience Discussion

Question: Will you you run through for me again the definition that you're using for cost-effectiveness, cost-benefit, and cost-feasibility? These are not well defined in the literature.

Answer: Cost-feasibility analysis tabulates the cost of the program; it takes into account costs alone and compares those to a ceiling cost. For example, suppose you have $10,000 to spend on a program. It will cost $12,000 to implement program A and $9,000 to implement Program B; it is not feasible to implement Program A. According to our feasibility standard, we have to implement Program B. That's cost-feasibility.

Cost-utility uses a combination of subjective weights and expected outcomes. You don't take any measures of outcome, but rather estimate outcomes and place importance weights on those probable outcomes. It's the same logic as cost-effectiveness, except that you're guessing what the outcomes would be instead of measuring them.

Cost-effectiveness forms a ratio between a non-monetary measure of effectiveness, such as a test score and the program cost. Any traditional outcome data could be used as effectiveness data.

Cost-benefit places a monetary value on the outcome. For example, computer training may result in a benefit of $5,000 increased yearly income. You form a ratio between that monetary value and the cost of the program. Does that clarify it a bit?

Answer: Yes.

As there are no other questions, I will give the floor to Larry.

Larry Picus

Thank you. I was asked to speak at this colloquium largely because I was the principal investigator for the vast majority of the studies that were critiqued in this re[illegible]. I spent a lot of time talking about them with Jana Kay, whi[illegible] was very enjoyable. It is nice to have someone at the Lab interested in the work I've done.

In reading the initial drafts and the final copy of the report, I was struck by the disparity between the four categories that Levin suggests as the way to approach cost analysis, and the four categories that encompassed the studies we've done. I'm wondering why this discrepancy occurred.

I've been familiar with Levin's work and his articles for most of the time I've been at the Lab. Why is it that we've gone off in a very different direction? There are probably two reasons. One has to do with the nature of the client requests. We were usually asked to provide the client with a description of program costs, so that is what we did. For example, in the first two studies, Numbers 1 and 1a, which were transportation studies, we were asked to compare the costs of two alternative transportation systems. It was assumed that the outcomes of either option were identical. A certain number of children would be transported every day to certain locations, and we weren't asked to consider differences in the quality of the transportation alternatives.

In other studies, such as the student activities study that we did with a number of districts in southwest Washington, measures of outcomes seemed very difficult to obtain. We were looking at extracurricular activities, such as bands, football teams, etc., where outcome data were difficult to obtain and measure. Even trying to come up with some cost information was very, very difficult. In my view, the major goal of that study

was to try to help the school districts establish a framework so that they could conduct cost comparisons between programs in the future. Similarly, in Cases 6 and 7 we were asked to describe programs for special student populations, and for Southeast Asian students. We weren't looking at outcomes because we weren't specifically asked to do so.

The program under which many of the studies were done has primarily tried to be responsive to client requests. I found Jana Kay's flow chart to be very helpful; it suggests that perhaps it's the responsibility of the contractor, the evaluator or economist to suggest to the client that other methods are available. Hopefully, we'll integrate that approach into our future work.

The second reason that the categories in our work were different from Levin's, in the simplest form is that I'm not an evaluator. I hadn't thought of these studies as evaluations, but rather as cost studies or cost descriptions. While evaluators often don't think of comparing outcomes with costs, as an economist, perhaps I didn't think often enough about comparing the costs to outcomes. Both sides need to be considered and brought together.

What I'd like to do now, is talk about ways that school districts and the Laboratory can conduct cost analysis studies in the future. We need to look at both the short term and the long term. In the long term, cost-effectiveness and the cost-benefit analyses require a great deal of effort and time. In particular, cost-effectiveness, which Levin seems to feel is the most appropriate in education, requires good evaluation measures. When you start a program, you don't have any outcome data available immediately. For example, in the early days of Title I, the expected improvement in student achievement took much longer to show up than anybody expected. People sort of thought that with all of the money being spent on the program, the kids would do better immediately. However, if I understand the literature correctly, it took nearly five years for these gains to begin to

show up. Cost-effectiveness analysis has a positive future if plans are made now to collect data for future use.

In a recent issue of Education Evaluation and Policy Analysis, Stanley Pogrow suggests that we need to move to looking at the cost side of things, and hold the effectiveness measures as a constant. I thought that that was a little extreme, as I'm not sure we should say, "Here's what our outcome is; how can we do it for less money?" We certainly need to look at ways in which we can increase productivity as well as decrease costs in the schools. In that case, I think the tools that Levin proposes, particularly cost-effectiveness, are very valuable. Over a period of years, we can evaluate results of alternative approaches to some programs, and we can say, "Did we do the same thing with less money, or did it cost us more money? How can we direct resources to maximize our outcomes?"

In the short term, school districts still have to make management and budget decisions. Every school district is faced with either a constriction on funds or a much flatter rate of growth than they saw in the late 60s and 70s. The issue is, where do we cut our budget, not, where can we spend money on educational programs. So there are some immediate needs as a school superintendent or as a manager of a school program strives to make intelligent decisions in putting a budget together. In that case, some of the work that we have done, which attempted to respond to those kinds of immediate questions, should be helpful initially.

There are some dilemmas that cost analysis can't answer. Levin shows us in his book one dilemma associated with cost-effectiveness analysis that results from drawing comparisons between two programs. What should we do if program A has considerably more per-pupil achievement than program B, but the cost of a unit of achievement is lower in program B? That is, with a fixed level of funding, we can increase total achievement in a school district more with program B than with program A. If program B is retained and program A is dropped, then some

children are not given the opportunity to achieve as much as they might have achieved, but more children will show a modest gain in achievement. I don't think that this is a problem cost analysis can answer, but rather one that school boards or school administrators are going to need to look at. It's a social question. Given the fact that resources are limited, we are put in the position of having to make decisions within those contraints.

Some changes could be implemented without a preliminary analysis. For example, it seems to me that as we talk about the immediate future and dealing with budget reductions--the Commission on Excellence Report has been getting a lot of attention lately--there are some things that can be done that appear to be low-cost items. Michael Kirst has reported that there are a lot of things that can be done which don't cost much money. We can work with teachers to improve the amount of time spent on direct instruction during the day; we can ask them to assign more homework. These are things that shouldn't cost too much money and hopefully will lead to increases in achievement and performance.

There are some other possible changes that are big ticket items, such as increasing the length of the school year; paying teachers for 11 or 12 months of service; increasing the length of the school day; paying teachers more money. Those are very expensive, and I don't see any way that those can be done without the application of additional resources to education.

I have been talking about two divergent streams. First, as we start making decisions, some school districts have tax bases that are not very secure these days and require short-term budgeting considerations. On the news this morning, it sounded as if most of the 98 districts in Oregon that had tax levies on the ballot went down to defeat yesterday. So we have a lot of districts looking for money, and more and more of them are coming closer and closer to closure before levies are finally passed. That means that districts are constantly looking at their budgets, reworking them, making decisions, making reductions,

right up to the last minute, sometimes after the fiscal year has started. We need some ways to make decisions in a short term about where those cuts are made.

Second, we need to start looking at our programs and thinking of relating outcomes or effects to the costs, so that in the future, as we start doing some long-range planning, districts can make good decisions that help maximize educational outcomes while minimizing their costs. I think it's very important that schools start thinking immediately, whether it's starting a new program or looking at the current ones, to plan cost analysis into their evaluations from the beginning, if they want to do a good cost analysis.

A good cost analysis may be either cost-effectiveness or cost-benefit. However, both these methods have difficulties associated with their respective outcome measures. A cost-benefit analysis, where you attempt to "monetize" everything, is attractive because it lets you compare across all ranges of programs. However, it's very difficult to do with the first-grade reading program. I'm not quite sure how we can determine what the effects on an individual's future earnings are going to be whether they were in reading program A or program B in the first grade. That's why cost-effectiveness analysis seems to be favored. Cost-benefit analysis may have some uses in vocational education programs or college preparation programs where the quality of the program may impact the level of schooling that the person goes on to achieve. I think cost-effectiveness is really the one we need to look at. We need to be very clear as we plan our evaluation strategies as to what our measures of effectiveness are, and whether or not we can keep them consistent from year to year, so that we can compare them to costs.

We've talked about measuring outcomes; the other big issue is how we measure costs. One of the things that I found in my studies is that it's very difficult to get good cost data from educational agencies. I have a feeling that at least one of our panel members will discuss this problem in more detail later.

Having served on a citizen budget committee for a school district, I know some of the difficulties in determining costs. We've always struggled with that. Schools traditionally have not measured all of the true costs of any given program, including relating administration and other cost factors to the program costs. It makes it very difficult to compare program A to program B.

I found in the cost work I've done, that in many districts, a lot of people rely heavily on the school administrator to determine how a program will be structured. The assumptions made about programmatic structures will influence the outcome of an evaluation report. Outside evaluators need to be independent and to make some hard decisions about what a program should look like. The addition of one teacher, administrator, or computer programmer can change the outcome of a cost analysis dramatically, particularly over a period of years. I've seen in a lot of our work that if the administrator would like to go a certain way with a program, he can load staff here or there to make that happen--to affect the outcome. In addition to knowing what the costs are, we need to be sure that we're accurately determining what the components of the costs are.

Finally, I'd like to conclude by saying that cost analysis is really only one tool that school administrators are able to use in making decisions. They all deal in a world that looks at many factors which influence any decision being made. Pure cost analysis and the making of decisions only on the cost of something will never happen in a school district. I understand that Beaverton is considering closing two schools this week. Saving money is one important element in that, but as we're learning in Portland, there may be other factors that are more important, as we deal with the possible secession of a very wealthy and supportive section of their district from the district. Political and social factors impact any school board's and administrator's decisions in the final analysis. It's very important to always keep in mind that costs are only one factor

to be used in making a decision on what the program or structure of the school district will look like. Are there any questions?

Audience Discussion

Question: Were you suggesting in your concluding remarks that cost-utility is the most needed technique?

Answer: No. I think that cost-effectiveness is the most appropriate technique. However, an accurate cost-effectiveness analysis is probably not possible today, because the data haven't been collected that allow us to put it together. That's the problem we've run into consistently. With the results of a good cost-effectiveness analysis, a decision can be made about what the programmatic structure should look like. It gets back to some of the other social questions: do we maximize total achievement in the district? do we provide the opportunity for those few children to achieve the most? I don't think that that is autonomous or that I want to make that decision based only on cost-effectiveness data. There are other concerns that need to be worked out. The entire school community needs to look at those issues as well.

Question: As I understand it, cost-utility is the placing of value weights on different outcomes.

Answer: Right. Cost-utility places probabilities on the likelihood of achievement. For example, the probability of program A resulting in a one-grade level increase in math scores is 50 percent, and for program B is 30 percent. These probabilities are then multiplied by importance or value weights. Cost-utility analyses can be helpful in making subjective decisions, but I think it would still be helpful to really have some good outcome data to help make those decisions.

Jana: We'll now move on to the panel.

Zeno Katterle

Larry Picus mentioned the success or lack of it concerning the passage of special operating levies. I'm still in the state of euphoria. As one who works as close to a school board as I

do, there's one thing that I look at more closely than the results of a levy or tax base election and that is the election of board members. Most people miss the significance of a board election. Ordinarily I don't comment on individual board members or candidates. I'll simply say that the recent election couldn't have come out any better from my point of view. Rational decision making may flower in part as a result of the election. It could have been quite different.

I tried to think through how I would identify some type of evidence or examples of cost analysis as practiced by an individual district. The problem I had was trying to separate cost analysis from the larger context. It was more useful to me to take the perspective of a rational approach to making district decisions. There is a variety of evidence to support attempts to be more rational, whether you put it in terms of program budgeting, being accountable, or just the general concern with productivity.

I found it helpful to look at what the district is attempting to do by using a rational framework, and then to see how cost-analysis applies. As a matter of fact, I think that if you asked representatives from local school district boards what they think of cost analysis, they'd shuffle their feet and try to find an excuse to talk about something else. They wouldn't know what it is, to begin with, and probably wouldn't be all that interested. If you asked the question from a broader perspective, you'd find that there's more evidence of attempts to cost programs and make comparisons among those programs than we may realize. In terms of change, most of what happens at local district level involves three ingredients. One of those, hopefully, is that the change is in part based on rational decisions. It can be argued that the attempts at cost analysis strictly on a rational basis contribute information that potentially makes for better decisions. It takes a lot more than rationality, and I don't think that's all bad. In addition to a rational base, there usually has to be the right political climate plus economic necessity. If you can put those three things together, the

change is possible. I think, in fact, that characterizes the environment we're working in right now.

Larry implied that, at least on a comparative basis, we're dealing with less revenue to do the same job. I agree. The expectation is that government will not continue to grow in terms of the level of expenditures. Unfortunately, I don't think the expectation as to what we produce in the way of services is declining. Quite the opposite is true. The expectation is for the level of service to improve. Less revenue and increased expectations have something to do with a need for greater efficiency. So we have the real problem of trying to provide an improved level of service, with fewer dollars. This situation will continue for the foreseeable future. Another factor is the accountability movement. It is also related to the need for efficiency. These two factors have done a lot to create a setting where cost analysis is more feasible, will be taken more seriously, and, frankly, is more necessary for making sound program decisions.

With that in mind, I tried to look for some specific evidence that perhaps the use of improved cost information is really occurring. One thing that struck me is that we have an over-simplified perspective about school programs. We talk about programs as though one program is the same as all other programs with respect to managing and making decisions. That is a mistake. This is apparent when you are talking about cost data. Support programs such as transportation, food services, and maintenance, as opposed to instructional programs such as language arts and science, are much more amenable to being rationally managed in terms of program definition--what they're designed to do and the measurement of the outcomes. The use of cost analysis is much more applicable when talking about support as opposed to instructional programs. Support programs represented a substantive aspect of the school operation, and that's where, in my experience, most of the cost analysis work is going on. In many cases, it has been pretty good work. It isn't

coincidental to my observations that a number of the studies cited in Jana Smith's report are support programs, such as transportation.

In my local district, we've used a process for five years that we call a program review, which is based on technology that was developed with zero-based budgeting, really better described as zero-based planning. Our board, by policy, requires that each year we look in a very thorough manner at between 20 to 30 percent of the district's programs. There are approximately 45 programs, support and instructional. Part of the review involves looking at what kind of a program would be provided at different levels of funding, and what alternative structures could be used to continue to approximate or improve on program performance. This can't be done very well unless you clearly define and cost the program and make some assumptions about the possible outcomes.

It has taken the district about five years to develop the attitudes, values, and techniques to make the review process work effectively. In the context of the program review process, there are a variety of examples where cost analysis has been required. In most cases, it's fairly rudimentary and doesn't focus as much as it ought to on results, but tends to focus on cost comparison or cost-feasibility. In transportation we've looked at things like comparing the replacement of buses with the remanufacturing of buses. We've looked at diesel engines compared to gasoline engines. In risk management we've looked at self-funding compared to premium-based programs. In facilities we've compared the closure of different schools or combinations of schools. We've looked at various energy conservation features in new buildings, or remodeling of existing buildings. We've looked at different ways of organizing and equipping our custodial staff in order to achieve better results in relationship to cost.

In the educational area the district's attempting to put together different scenarios and the associated costs, and hopefully some definition of results with respect to implementing a kindergarten program. We will consider a combination of contracting and operating our own program at different service

levels. We're making various kinds of assumptions about what kind of a program will be achievable, given certain limits on the ability to fund the program. That's proving infinitely more difficult than it was with the support services examples that I previously cited.

One of the problems experienced by the district is that our constituents aren't all that wild about our trying out alternatives. The word is experimentation, a word you don't use where I work. Before implementing an alternative, you have to almost simulate or approximate what you think the results are going to be and hope you've made the right decision. By the time a major program change is put into place with all the political commitment that's required, you're not about to throw it out two or three years later and say "Well, let's go to another plan."

What are some of the results associated with the activities which I've described? One result is a much better definition of program. The cost-analysis aspect forces you right back to the sort of thing that Larry Picus talked about, trying to figure out what you're doing, what are the costs, and what outcomes you expect. It's not accidental that some of these data have been hard to come by. Educators have purposely made it difficult to define the programs and the costs associated with them. There are some very good reasons for this and in part it has to do with survival. Nevertheless, I think a greater value is being placed on program definition, including the associated costs. On a related basis, there is a different perspective about the kind of cost information that is needed to make choices along with the political, social, and policy issues that are involved.

Another beneficial outcome has been the willingness to begin to look at alternatives. We are faced with a different reality. With reduced funding, it's frequently a question of whether or not we're going to be able to continue to operate a program. The only basis on which the program can continue is to restructure and offer it at a different funding level, as opposed to throwing it out altogether. That's a different reality than the one we've been used to, which was "Hold everything where it is and we'll

just increment increases on top." The politics have changed considerably and, as a consequence, people aren't willing to accept the incremental approach. As a result of the change, we're getting more accurate cost allocation and description.

In addition, there is a recognition that rather than incrementing, you have to look at redistributing funds. This involves taking funds from some programs and adding to others. This approach is better than undergoing a process of gradual erosion of everything. That would lead to the mediocrity or death of the organization. I think the awareness is there, which means taking dollars away from selected programs and putting them elsewhere in order to continue to add and improve programs. Though there may be fewer dollars to do the overall job, I know of no substitute for money.

Another beneficial outcome is a multiple year perspective, rather than just "What are we going to do next year to get through?" That's not unimportant, and certainly a number of districts are in a survival mode and making it through next year may be the most pressing need to consider, but I think there is a move toward looking at programs, their costs and benefits, over more than a single year.

My first temptation was to talk about all of the problems associated with cost analysis. The first problem I've already mentioned—the lack of awareness and appreciation of cost analysis. There are a number of others. It's difficult to agree on objectives. We don't have very good measurement tools. Alternative needs are perceived as experimentation. We haven't yet figured out how to clearly differentiate between direct and indirect costs. We can't control as we might like to, for outside variables. There is political resistance to the whole idea, both internal to the staff and external to the community. There is a considerable lack of technology, skill, and tools. You can look at the list of problems and say that's a mountain we'll never get over. I don't happen to believe it's insurmountable. The problems are some of the realities and we can face them.

What does the future hold for cost analysis? This is always the safest thing to talk about because nobody knows for sure. A study was recently completed by a task force, appointed under the auspices of the Education Commission of the States. One of the task force recommendations is: "Educators must make better use of existing resources because no consensus for increased investment in education can be built unless citizens are convinced that schools are sufficiently productive." I happen to agree. My point is that the need to make better use of existing resources isn't going to go away, and shouldn't. But there is considerably more work needed to adapt the cost-analysis concept, technology, and tools, to the local school situation.

In addition, we are going to see a differentiation in the way cost analysis is applied among various programs that a school district operates. I also think we'll see variations applied to instructional programs that might be quite different than what we would see in support programs. The success of cost analysis is in part going to be combined with some other fairly critical issues, and those have to do with things like how willing we are to operate with a number of alternative approaches. Selling the idea of greater decentralization of authority and decision making within the school system are also going to have a lot to do with the successful use of cost-analysis.

Bob Rath

I would like to start by underscoring what others have said, and that is that the economic conditions have a great deal of influence on the way we look at things. The historical mode is to start throwing brickbats at the educational institutions. That always happens when we have a recession. We get a lot of advice, such as: reduce our offerings; don't do as much; don't do so many things for so many kids and people; restrict access; raise our standards; reduce opportunity. All of those kinds of things, so we're in that status at this point.

I'd like to tell a story about the pig with a wooden leg. This is about the way education is being treated these days. A salesman driving along in Eastern Oregon looked out and saw a pig with a wooden leg. He was fascinated because he'd never seen a pig with a wooden leg, so he drove into the farmyard and said "I've never seen a pig with a wooden leg. Would you tell me how that pig got that wooden leg?" The farmer said "Oh, that's a wonderful pig--an outstanding pig; the best pig I ever had. One night my wife and I were in bed and the house caught fire. You know, that pig came over and made such a clatter, woke us up, got us out of there and saved our lives. A wonderful pig." The salesman said "That still doesn't explain how he got a wooden leg." The farmer said, "Not only that, one time I was down on the south 40. The tractor hit a soft spot, went over, and I was pinned underneath. You know, that pig came clear out there to the south 40 and rooted around and finally got me out...saved my life again. Wonderful pig." The salesman said, "You still haven't explained how the pig got the wooden leg." The farmer said "Well, a pig that good you wouldn't want to eat all at once!"

Maybe education is getting treated like that--a pig that good we wouldn't want to eat all at once. Part of the circumstances in which we find ourselves is being faced with a whole series of recommendations of how to make things better, not the least of which is to make them better by spending less money. You've seen many of the reports, such as the Commission on Excellence. That's a way we get recommendations of how to improve education. The data base may be very much askance, and the recommendations may be very much politically motivated; many of the interpretations are. Nevertheless, I think they are based on the premise that we can improve education. School Improvement Research and The Results of School Improvement Efforts are also a set of recommendations to us of how to improve schools. Notice, those two do not really talk about costs at all. Some people would infer, as the National Education Association quickly did, that the Commission on Excellence would cost multiple billions of extra dollars from the federal government. Another famous

American interpreted it saying "Oh, that means we need prayer in schools, voucher system, and tuition tax credits," so it depends on how you interpret the recommendations.

I have not read the report put out by the Foundation for Oregon Research and Education, but I was struck by the news as it hit last night and this morning. This is almost a quote: "Oregon education gets a poor grade. The study says that Oregon schools are getting the same performance in spite of increased dollar expenditures." Beautiful statement. If you delved into the background of that, from the little I know, I think I could make the following statements. First, if you look at how costs increased, and they have, the teachers' salaries have probably increased at a lesser rate than all of the other costs. Our inflation of costs have been in the non-staff cost areas: insurance, fuel, maintenance, those kinds of things. The common assumption out there is that the teachers are the ones that are benefiting. Second, we probably have more kids staying in school longer; it's bound to cost more.

I have a hunch that we've installed certain programs where the mode of service delivery is mandated and is a much higher cost. I'm talking about special education. I could go to the Commission on Excellence and to the Foundation for Oregon Research and Education and say "I have the way to solve the problem. If you took off the bottom ten percent of the student population, got them out of school, then all of these factors on which they say we're doing so badly would be changed and we'd be better than we were in the last 20 years." We have to listen to these recommendations with a great deal of skepticism.

Now, more on the notion of cost analysis. I have some feelings that so much of our cost and effectiveness work has been pigeon-holed into what I would call organizational dichotomies, and perhaps this is the first place we have to look. Some of the places where I go, the financial people and the economists are called bean counters. We also find evaluators set off by themselves, outside of the main stream of the organization. It seems to me that one of the things that we have to deal with is how to

get those two very needed functions, that is, cost-analysis and measurement and reporting, into the organizational mainstream of the schools. I can't speak about hospitals or other places, but think it's true about schools. To do that, we're going to have to examine the unit of the analysis and the unit of accumulation. Most of the effectiveness work, that is, evaluation, has begun from a top down demand, from the federal government, and we've all been very carefully responding as much as we need to to satisfy those federal responsibilities.

Second, it seems to me that the unit of analysis has primarily been in a school district. If you ask what the budget or expenditure is, you can always find out what they are for a school district. You can rarely find it at a building level. It is possible, though. You can, at times, find program definitions and programs can be utilized as units of analysis and accumulation. It seems to me that with our current technology and thinking, the most logical and promising unit of accumulation is the building level, and I would suggest that this would have the greatest promise for us to look at cost and effect--at the building level. There are going to be a whole series of things that muddy the water because, as we all know, the variability in costs tends to be almost 100 percent variability in just the teacher's salary alone, so you have to look at it carefully. Nevertheless, I believe that school-effectiveness research is best implemented at the building level. I also think we can adapt cost-analysis to a building level and come out ahead.

What this probably means is pretty careful negotiation of a set of definitions, and I'm not sure that cost-effectiveness and cost-utility are the best set. Maybe we have to do some simplification. Maybe we have to look at what is the plan at the building level instead; what are the budgets for that plan at the building level? Then document what happened as that plan was implemented, and what it cost at the building level. Then look at the outcomes at the building level. All of this is completely feasible at this time, and we can begin to look at the building level as the unit of cost and effect. I think we all know that

it's the building level that is the building block for budget elections, whether it be school board member or budget elections. But this negotiation is of a set of common terms that can be used year after year as a data base, not a study base, and not as just an information base, but rather as a data base at a building level. Cost analysis is feasible and can be done, but hasn't been done very well yet. Effectiveness analysis can also be done, and Nick Smith, in his program, has led us to new ways of doing effectiveness analysis. If you can do those separately at the building level, we can make sense out of it.

Don Egge

I thought a little about a title for this session. One was "Pity the Poor Manager" or "Can Cost Analysis be User Friendly." An alternative I had was "Creative Cost Analysis, or How to Kill a Bill by Referring it to Ways and Means." I could go on... Jana Kay suggested that we give some of our own experiences, and then talk about the future. As I thought about that, I remembered, as a high school principal years ago, my inability to make a case for the needs of our school. I went on to graduate school, taking the usual courses in economics, public finance, school finance, etc., as part of the administration degree, and still I was incapable of understanding and expressing fiscal needs and impact.

My first year in a central office was as an assistant superintendent in the Lincoln County School District, a district consisting of ten small communities. The district was struggling financially when the new team of administrators arrived. Within a few months the district faced the difficult problem of what to do with an aging bus fleet that was totally inadequate to handle the half-a-million miles to be covered each year. Our business manager produced a single document, fairly simple, straightforward, but superb, which was presented to that board. On the basis of seeing the history of the problem we were facing and the projection of the future, the board made a timely decision to

sell the buses and get into a leasing program. It was the correct decision for that time.

As a superintendent a few years later, I remember two incidents that really came home to me. We had two situations: (1) we had a grandstand burn down at Newport, and (2) we had a locker room in Siletz which seemed to constantly have 18 inches of water in it, mostly on the girls' side. As the school board started to deal with the two issues (remember, each of the principals in those ten small communities worked with the local school committee, building up his own constituency), each problem was joined by every other problem those principals wanted to solve. The local school committees got behind them, and we had what could have been a very difficult confrontation between the board and each local community. Because we were able to pull the problems apart and provide an analysis of the individual sub-problems within each issue, we were able to avoid a very difficult time, with a fairly high degree of satisfaction of those involved.

I work at the state level and we have a different set of problems from the kinds Zeno was sharing with us. We face both macro and micro issues. We have a budget of $1,245,000,000. We must come to the legislature every two years and try to provide options for that body, which will result in good decisions. The process is not always rational. It is often said that when the legislature is in town no one is safe. If you have been watching what has been happening in this session, you know that it is indeed a very irrational process. Nevertheless, we do go through a series of steps that start with very small pieces and which grow and accumulate to very large kinds of decisions.

When we speak of grant in aid, i.e., distribution of payments to districts, we mean things such as a special education formula for distributing money to regions, to districts, to serve high cost, low incident students. Or, when we were assigned to administer the new block grant, we defined a formula for distribution to local districts recognizing both student enrollment as well as high cost studies.

When we work with the legislature on the formula to find basic school support, community college operations or any of the other categorical programs, we provide analyses that hopefully help the committees cope with those tough decisions.

At the state level, almost every issue has a fiscal dimension. Our biennial budget affects all segments of education. To obtain approval, we go through a lengthy process: (1) reviewed with the state board, (2) reviewed with the governor's office, (3) reviewed by the Oregon Education and Coordinating Commission, (4) reviewed by the education subcommittee of ways and means, (5) reviewed by the full Ways and Means Committee, and (6) finally, by the legislative body itself. If anything can survive that, in any form of rationality, I'd be surprised. Every budget we submit is based on a six-year plan: the last full two years; the estimated two years of the current biennium; and the projected two years. We're trying to make cost projections that effect local school systems based upon where things will be in 36 months, or even longer.

As priorities are identified and supporting analyses are prepared, the state board is pulled between and among constituency groups that want more money for talented and gifted, the handicapped, child development specialists, vocational education, and the disadvantaged. At the same time, the board is aware of the views of the governor and the legislature. The board has come to the conclusion that a budget plan must be presented which meets the needs of the education system of Oregon, even though it may not be realistic in terms of the funds available.

Within the agency, we develop a variety of cost analyses when we have special problems. Some of those special problems affect districts. For example, we might have the Secretary of State's office telling us we must change the indirect cost rate: we must pull federal money from programs and use it to fund department operations. To accomplish this assignment, we must understand the balance of impact on the federal program on our agency and on our distribution to local systems.

I have tried to look at our topic at the policy, management and service levels. At the service level, one of our responsibilities is to help local school districts cope with the cost analysis or management information problems that they have. You may be aware of the managing-cost-creatively project we conducted a year ago, in which we tried to collect and share ways to conserve resources. For example, we referred districts to other districts which had compiled cost-analysis. We shared the Beaverton study on diesel versus gas buses, the Ashland study on new approaches to roofing, and the process that the Portland district used in managing cost reductions. One of the roles that we have is to share that kind of information.

A second responsibility is to collect information from districts for state or federal purposes. One of the things we're trying to learn is to develop our reporting forms in such a way that the information given to the state by local districts can also be of use to the local districts.

At least one program in our department has taken the information given to us by local districts, transformed it into management information, which has been fed back to the district. You may be familiar with the work in the food services computer program that translates raw data into a printout for the local food services or business manager. The report describes some of the relationships between costs and outcomes, such as meals per labor hour. Our food service people are able to circle factors they want to call to the attention of the local food services manager, following up to provide assistance and training for making better decisions.

We were asked to comment about future possibilities. My comments are more reactions than predictions. We must remember the difference between research and evaluation. I'm not a scholar, so I can't deal with some of the refinements, but rather than looking for truth, what we are looking for is information to help us decide and act. As a manager, I am willing to use my judgment, my experience, and others to help me examine the information we have, and to translate it into good decisions.

The issue before us is that we now have very little management information available to us. We have extensive data and reports, but not very much of it has been translated into management information. However, I believe we've seen over the last decade an increased willingness and ability to begin to create and report management information which is simple, direct and timely.

Data are not always information. A little information may be better than none at all. We may not need precision, but what we may need are trends, in terms of effectiveness, productivity impact, etc. A rule-of-thumb might be to obtain the absolute least amount of information needed in order to make a decision. In order to do that, the manager must be clear in expressing to the analyst what is needed. Jana's premise is correct that most folks are not prepared to ask the right questions.

We've heard some comments about the need for cost-effectiveness. I believe we're going to learn a lot about the subject over the next 15 to 20 years. We may waver between two extremes: (1) there are complex, highly sophisticated reports that may not be of much use to the manager or policy maker; or (2) there may be simple displays which allow the manager or policy maker to review information sets when considering options. The second may not meet the usual tests for validity and reliability, but the manager is often willing to accept less than what we often think is desired and needed.

One of the things I've learned is that there are some things I can control and some I can't. When you talk about time, you have a state board that says you must have 175 days of schooling. You have a local board that says how those days are going to be organized. You have a school that says when the period will start and end, and when the lunch hour will be scheduled. Then you have a teacher that's really responsible for most of the academic learning time decisions when the door is closed. We ought to learn how to deal with and recognize those things that are controllable, and those that are not controllable. We have to respect the role that each is to play and how we can use that

to help make decisions at the various levels. We need to give each the proper information.

Secondly, I believe there is a lot of readiness for cost analysis. During a period of fiscal constraint and return to conservatism, people are willing to look at things in a different way. You don't really know whether it's because they're committed to good stewardship, or whether they just want to survive. We know, for example, that of all of the superintendent firings in the last couple of years, the root of each dismissal was the inability to manage costs. I believe the general readiness is real.

Cost analysis can help us to make better decisions. I would challenge one of the statements made earlier in this session. I don't think it's wrong to try to conserve educational resources. I believe we must. We may even want to return some of those resources to the taxpayer, or at least broaden educational opportunity when we find new efficiencies.

Finally, educational systems are complex social organizations. They're not always rational; goals are diffuse. These tools ought to help us identify and describe educational problems while understanding the impact of potential solutions. Let us continue our search for improvements in our capacity to gain useful information.

Audience Discussion

Question: I'd like to make an observation and perhaps get Don's reaction to that observation. I really appreciated the insight you imparted with respect to the decision making process and how different kinds of information are used in that process. I think that one of the deficiencies in evaluation is that it is a professional field. You distinguish between evaluation and research along these lines, and most evaluators, especially the young ones, have this desire to be elegant and sophisticated and reflect their research background in the approach that they take in conducting evaluation studies. They pay lip service to the idea that the purpose of evaluation is to provide data for

decision making, but very few of them have a very good grasp of the nature of the decision making process that they're feeding data into. Quickly, some of the characteristics of that, as I heard you define them, are idiosyncratic, context dependant, complex in nature, and very difficult to model. You can't reach out and grasp a particular decision-making model and assume that it is in use. Maybe we need some mechanism that would baptize evaluators into the holy water of decision making and drown a few.

Answer: You really captured a concern I have. Most research can probably help us in evaluation; it can be useful for evaluation and decision making. Probably some evaluation could be useful to research. We do need to be clear about the difference. I like your summary of the complexity of decision making. I made the comment "Give me only as much information as I need." I also would like to say that I may not always know what I need, so there must be a communication and negotiation between the decision maker and the evaluator. It is important that they continually touch bases to make sure they are together on the issue. I believe one danger is that you could put on such a beautiful display that everyone would assume all variables were included and not give further thought beyond the report. I don't think decision making and policy making should ever be void of experience, judgment, timing, and an understanding of the variables. However, it isn't possible to include all these factors in a cost analysis. But, hopefully, the decision is better when they are coupled with good information.

Walt Hathaway

Now that we've listened to Zeno's and Bob's and Don's speculations and observations on cost analysis and education in general, I'd like to make a hard-hitting, data-based, scientific presentation on the specifics of cost analysis in educational evaluation. Unfortunately, I'm not prepared to do that. I therefore will echo and perhaps argument sentiments of the need for a common sense approach to approximating attainment of the vision that many of us had through the mid-60s and early 70s

about applying econometric models and processes to education and coming up with true cost-effective modeling for informed decisions in education. And I'll try to do that from a local perspective.

I want to state a hypothesis about the sad state of cost-analysis in public school evaluation, give some evidence for it, and an explanation of why I think the situation the hypothesis describes is the case. I will then talk about the concept of cost-effectiveness and the historical and theoretical problems that I believe have impeded our progress in making cost-effectiveness a central and effective aspect of educational evaluation. Finally, I will describe some of the things that we are doing in the area of cost-effectiveness and evaluation in Portland as a system and as a department. In closing, I will make a couple of very non-revolutionary suggestions.

The hypothesis is that in spite of the lip service paid to cost and program evaluation, these studies have not been, and are not typically now, a primary concern of the school district evaluation units. When costs have been a concern, they have usually not been competently or comprehensively dealt with.

Evidence for the above hypothesis is to be found in the literature that you all monitor and are aware of. When was the last time you read an evaluation that dealt with the cost and evaluation and linking of the two in some incisive way? As I reflect back on the last ten years or more of meetings of a national group of directors of research and evaluation that I attend each year the day before the American Educational Research Association annual meetings, I find that rarely has the issue of cost-analysis and evaluation come up at these meetings designed to share concerns. Similarly, Division H, which is the program evaluation and development division of AERA, has for some years now been giving out awards for the best work in evaluation around the country. Hundreds of people doing evaluation send in their best work for review. I chaired this process a couple of years ago and have monitored it since. I looked over, as part of our preparation for coming over here, the list of this year's awards.

Even in the category where you would expect to find something, "Findings from a Research Study of a Management Related Item," the best reports did not indeed deal with cost in a forthright or particularly accurate way. There have, however, been exceptions to that in the past and I will cite some of those.

There are two school systems that I know of, and I'm sure there are others, who have been trying to deal creatively and intensively with this issue of costs system-wide, and relating costs to evaluation. In the Montgomery County School District, where Steve Frankel has the accounting function under him as well as the functions that are more traditionally in R&D units, there has been careful and effective attention to cost analysis in evaluation. While Larry Barber was there, the Eugene School District also worked in this area effectively. They did some studies that actually involved savings of $250,000 or more a year to the system. These studies had to do with such things as different kinds of fuels and choices between employment of aides and other instructional support personnel. So it's not impossible to do useful work that deals with the relationship of costs to outcomes, and informs decision makers in a timely way. Such work affects decisions that trim support budgets and thus free up more resources to affect kids directly.

The last thing I did to check out my impression of the impoverished state of cost analyses and evaluation was to look at a publication which some of you are familiar with, which is Research and Evaluaton Studies from Large School Systems, an annual ERIC publication that runs about two years behind current practice. The only entry here (out of thousands) that comes under the heading of cost-effectiveness is a cost study of year-round schools that was primarily in accounting. Thus, we basically find one report out of thousands of research and evaluation studies which were submitted by large school systems that explicitly dealt with cost. I think we can take it as the fact that not a lot of work, or at least not a lot of good work, is being done in this area, but that there are examples that show that it is possible.

One explanation for why we in evaluation units have not been taking the lead in getting such work done includes the fact that most evaluators and directors of evaluation come out of an educational psychology or an educational administration background, where there has been little concern for cost. They didn't teach me a whole lot about cost analysis when I was studying educational pschology measurement and evaluation at the University of Pennsylvania. But earlier when I was at Penn's Wharton School of Business and Finance doing a dual major in systems engineering and operations research with the Moore School of Engineering, that's about all they ever talked about besides circuits.

Another explanation is that educational research and evaluation units are usually aligned with the instructional and direct instructional support units, both philosophically and orgnizationally, in terms of mission and goals, rather than with the business side of the organization. That's pretty much an unknown territory. Organizationally, we hardly ever sit down and talk to the business people. We don't even know what they do, and that's where cost can most readily be dealt with, as Zeno was pointing out. This doesn't mean that instruction doesn't cost money. It just means that we don't have as many people well-trained and conscious of cost on our side of the street. All you have to do is look at typical school district organization charts, and you will see that this is the case.

Finally, the concern for costs in education has been linked with econometric modeling and with the development and application of the Program Planning and Budgeting (PPB) method that had its heydey in the mid-60s and early 70s. This was sparked partially by some international concern by UNESCO and the Organization for Cooperative Educational Development that did have some success in using cost at a national and international level, and doing some policy planning. However, there wasn't a lot of follow-through in the attempts to apply econometrics, and not a lot of success and rewarding feedback from those attempts,

so as we moved into the mid-70s, a lot of us who had been involved in that got very disenchanted with it.

At this point I want to quote what I think is a very simple, and yet useful, definition of cost-effectiveness analysis to illustrate why I think we're struggling getting to this idea of cost-effectiveness, and where we have to be instead. This is from Mark Thompson's book on benefit cost analysis for program evaluation, which doesn't apply solely to education, but is a good survey of the applicaton to social science in general. Mark's definition of cost-effectiveness analysis is "evaluating a decision alternative, first of all by making all aspects co-measurable in money terms, or in terms of some other single unit." The keynote there is co-measurabilty of outcomes. Really, really tough. Measurability, maybe. Co-measurability, probably not. And then comparing the two dimensions of impact? That's exactly where the dilemma is. Can we measure either cost or benefit? How do we develop useful co-measures? That is, how can we reduce educational outcomes to some kind of common metric of money or another underlying metric?

I want to illustrate how little I think the field has moved in this regard by quoting something that I wrote back in about 1969, which was entitled "The Use of Operations Research and Systems Engineering for Rationalizing the Decision Process in Educational Systems." This was going to be the grand synthesis on that subject. I stopped when it was 80 percent done because I was sick of it, and I realized I didn't really need to do it for the degree related reasons I was doing it. On page 74, one of the points that I made then was that one reason why true explanatory or econometric models do not yet exist in education falls back on the, by now, familiar problem of the lack of an explanatory theory of learning. This gets to the benefit side of the dilemma. If our dependent variable is economic well-being, and our independent variable is dollars entering into a school system, no true explanatory cost-effectiveness model can be built without two submodels: one that yields the effect of funds transformed into teachers, materials, and space in the learning

process, and another that yields the effect of that increased learning on individual and societal economic utility. To put it succintly, we don't even know how to measure learning, and therefore, it's very difficult to pinpoint comprehensive relationships of benefits (learning) to costs.

Finally, let me give a brief description of some of the things that we're doing in Portland in the area of cost-effectiveness and evaluation. The first thing I'd say at this point is that cost remains frustratingly difficult to measure accurately, comprehensively, and co-measureably in educational organizations. To give you an example, we've been doing an evaluation of computer use in the schools in Portland for two years, for which there is an apparent budget allocation this year of almost three-quarters of a million dollars. The "real" budget allocation, however, is that amount, plus whatever building principals and program leaders are allocating from their Chapter 1 and other discretionary sources of funding, in order to deal with the pressure that they're getting from the community and the staff to have computers. The agenda is equitable hardware distribution, rather than effective learning at this point and even at that the budget is difficult to ferret out, much less real costs and the benefits.

Still on the cost side, but getting away from budgets, we have costs that we could objectify, like the cost of hardware, the software, and the staff development, but then there are hidden costs and opportunity costs. The opportunity cost is an economic notion that we have to deal with when we deal with costs comprehensively. The opportunity cost represents other things that those dollars are not being spent for, like additional teachers, library aides, and things like that. The budget is not an accurate mirror of the reality of what is being spent, although we always work to try to make it so. So don't ever be deluded when you're trying to do an analysis of costs that you've got an adequate handle on it when you have merely the budget figures.

Benefit, or effectiveness, as I've already said, is even tougher to measure. For instance in an area like Chapter 1 we have short-term and long-term personal, system and societal benefits. We typically focus on a subset of the personal, short-term benefits, which is achievement gains. But what about the changes and gains for the system, and then the changes and gains for society, both short-term and long-term? I'm thinking of things like long-term health consequences, impact on crime rates, effects on otherwise disadvantaged children, and effects on numbers of people on welfare.

My conclusion is that if costs are difficult to measure accurately, comprehensibly, and co-measurably, benefits are almost impossible to measure at this point in education. Some of them are even difficult to define; that's why we find cost-benefit or cost-effectiveness analysis difficult to do.

In spite of the gloomy picture painted above as an evaluation department in Portland, and as a district, there are three things that we have been doing that show concern for and some progress in the area of cost-effectiveness in education. First of all, we bring our skills as evaluators to the district budget making and communicating process, and also to other cost related policy arenas such as school closures and consolidations. Reports of these activities are to be found in documents such as my article on Managing School Districts in a Decade of Decline. This report documents how we went about using objective information related to programs during a two-year budget reduction process so that we could use cost-effectiveness information to help decide what programs to eliminate or reduce when we were in our last major period of contraction.

Secondly, as a district we also occasionally do evaluations primarily focused on cost comparisons. I'm thinking for instance of a study that the transportation people did on the relative utility of propane versus regular gas. The study resulted in a conversion of some 50 vehicles to propane, with a savings to the system of $100,000 a year. Another study led to the use of

computerized transporation assignment systems, using algorithms coming out of the operations research simplex method. This effort is resulting in a savings of over $1,000,000 a year.

In recognition of my belief that management and cost studies are the direction evaluation departments must take in the future in order to continue to justify our existence, I recently hired somebody from the risk management side of our organization, which happens to be the business management side, as an evaluation specialist. Right now he has another assignment, but one of his long-term goals is to build better bridges between his former colleagues and us. That's the way to do cooperative anything--to bring in someone from the other side, or else go over to the other side yourself.

Finally, as a department we do program evaluations which treat the issue of relative costs descriptively. For instance, in our evaluations of alternative schools, at least we have tried to get at the per-student cost and the per-unit of instruction cost of each of these various education programs. We're also trying look at the cost-benefit side of things in our third year of evaluating computer use in the schools.

Those are examples of at least the kinds of cost related things that we get into as a school system and its evaluation unit, and our struggles to deal effectively with costs and benefits. The last thing I want to say is about Jana's report. I thought it dealt well with cases and reports where costs were the primary focus, and I especially appreciated the fact that the cases did deal well with the merely descriptive stuff. Before we move up that hierarchy, our goal must be to again describe the costs accurately, comprehensibly, and co-measurably, so that the cost of this alternative program is in the same metric as the cost of that program; not what their budget says, for example. And then, having done that, we can get into feasibility, comparing those co-measurable costs with a co-measurable limit, and we can get into utility, effectiveness, and benefit. The first job is just to work on good descriptive techniques. The development

of a workbook, a workshop, or any helps to that end would be appreciated by local, and, I think, state systems.

Of greater interest, perhaps, would be a study of the use of cost-effectiveness in program evaluations and policies analyses--to look at those where cost was not the primary concern, but where it was dealt with helpfully. In evaluation we don't normally primarily set out to evaluate costs. What we need to learn to do is just that; we need to learn how to deal with costs when our main job isn't to deal with costs. Again, I think a good source of that would be the general literature, the American Educational Research Association Division H awards documents, the R&E studies of the large school systems (in ERIC) and other sources. The study could provide examples of what's been done, and been done well, and then extrapolate some models and procedures for doing more of what has been successful.

Some of my conclusions are that as evaluators, we have a moral and educational and probably survival obligation to at least describe costs accurately, comprehensibly, and in comparable metrics. We have to realize that that is not easy and we need to work, at the same time, to extend the range of projected measures of educational outcomes and the range of less objective measures. It is pathetic to me that most of our decision making about effectiveness, when we do it in my school district and probably most other places, is based on measures of basic skills achievement, and that alone. This seems to be true of the whole body of research on educational effectiveness, particularly the effective schools research. We as evaluators simply must begin to move more aggressively and assertively into creation of better and more standard measures of effectiveness outside basic skills.

There is a regional cooperative being mounted in Oregon now, with leadership in the state department in the area of science measurement, that I think will be a good model of how we can move into other subject areas. There has also been some work in higher-order thinking and problem solving done by our district's gifted and talented people. By cooperating with the state

department in some other districts, we went outside traditional subject measurement and into other kinds of measurement.

Only after we've figured out how to measure costs accurately, and after we have better and more comprehensive measures of effects, can we worry about interrelating them into cost-effectiveness studies.

General Discussion

Question: First of all, I'd like to thank all of you for participating on this panel. A comment that I'd like to make: Bob mentioned that there are two groups of people. I think I'd separate the economists as another group, as they seem to be a separate group, besides the accountants and evaluators. The economists are the ones that work on methodology. As one looks back over several years, it seems to me there has been a big evolution from the evaluation side, from the educational administration side, and from the accounting side, in terms of looking more at the costs and at the effects. The things that haven't changed much at all are the methodologies. The general methodologies of cost-benefit analysis or of cost-utility analysis are the same ones that were written about 25 years ago. It seems to me we need help from economists who will be a little more sensitive to the fact that their methodologies cannot necessarily be held up as the ideal if they don't fit. We need some help from them about either how their methodologies can get better, how they might change, or something. It would seem to me that some evolution is needed there, as well.

Answer: I don't personally see anything either in economic theory or methodology that could not be applied appropriately to decision making in education at various levels. What I see is sloppiness of definition, sloppiness of description, and poor measuring that makes it impossible for us to use those theories or measures. That's where I think the real task is. Dollars are easy to count, and learning is hard to count.

Question: I hear the review of the work that has gone on; I see where the existing methodologies apply in service areas where you can count bodies transported. But you don't have the industrial contacts in education, so there are just a narrow band of places where the cost-analysis methodologies apply. I think it's methodological weaknesses as much as our failing to live up to the standards of assumptions behind the methodology.

Answer: As you were talking about methodologies, the thing that came to me, from the point-of-view of the manager, is that I would really like to know about product options of cost-analysis efforts. If there is something that needs some attention, it is perhaps a handy-dandy notebook of information on products. An analyst brings something and you say "No, that's not quite what I want. Why don't you try this?" And you start to massage it; it's a slow process and as a result, the methodologies have to get changed. It seems to me that you should be able to describe the form and way it would be delivered. Now, given that final product, the evaluator would know the alternative methodologies that would be available and could move ahead. My plea is that you shouldn't just think about the methods. Pity the poor user.

Answer: I'd like to take a stab at the question. I wonder if one of the problems with what's happened is that the bulk of economists' attention in the area of education has been focused on the school finance movement: how we distribute funds to schools, rather than how schools spend those funds. A large piece of that work has attempted to prove that if you spend more money, you get better results, largely through obnoxiously large and incoherent productivity function equations which try to show that one of the important factors in student outcomes is additional expenditures. What we largely try to do is take a model that works when the outcome is dollars and apply it to something where the outcome is people and abilities, or learning. To date there has not been a lot of success in attempting to find some other measure that works well. One of the problems is that a dollar is a dollar...minus inflation. People start with different levels of ability and are impacted by so many things along

the way that it is very difficult to compare what I got out of 12 years of school with what my next-door neighbor did, because of so many impacts that may have affected us. Methodologies haven't found ways to measure and control for that.

Answer: We are not a production industry. We are a service industry. A concept of productivity has merit for the way we look at things, as long as it is coupled with effectiveness and impact to measure and monitor the changes in the populations we intend to serve. We can also measure changes in the delivery of service, and for a service industry, that should be a part of our accountability.

Answer: Harriet Talmadge, in the most recent Encyclopedia of Educational Research, has an article on evaluation of programs that makes a very similar point that I think is worthwhile, about the benefit-cost perspective in evaluation programs. She categorizes the perspectives we bring to valuing, which is, of course, what evaluation is about, and identifies the benefit-cost perspective as only one of many. If we were building a model of the world from the point of view of an evaluator, we would have a set of arrows coming in that are valuing points of view. One of them is the social-political, then there's the personal, the long-range, and short-range. The cost-benefit perspective is there, and because of some of these methodological struggles, we just haven't been able to bring that valuing point of view to bear on educational decision making very well, yet. But I think we can. It's not just by looking to economics and their mathematical models and systems, log-delinear equations, dynamic programming, etc. We can look beyond that, just with common sense. If we could just display costs accurately at the same time we display gains and outcomes we'd be happier and better decision makers.

Question: As I listened to the presenters, I was struck by the themes that emerged from each one of them. Bob said that we ought to provide information or get information from the building level. I liked what Zeno said "We need to evaluate alternatives before we implement—you can't just implement a program without

looking at it. Experiment." In terms of costs, what I think we can begin to do at the building level is to compare costs, do "what-if" analysis, and generate some alternatives. With the advent of microcomputers, it seems to me that some of the interesting and fascinating things to do are directed at the manager: "What if we buy computers and enlarge class size?" and "What if we do this?" That's where we could do some of the analysis rather than obtaining actual effectiveness measures.

Answer: There'll probably be a laboratory created here in the city for that kind of thing, if you're seriously interested in pursuing it. We are considering reinstituting a program called the Instructional Improvement Fund in the Portland system, which will create a pool of monies accessible to people at the building level. To apply for the monies will be a fairly uncomplicated application process: a mini-grant process. There is a one-page form to be filled out, which tells what the proposed outcomes are, the benefits to students, how to evaluate it, what the school is going to do and what it will cost. The decision-making process to evaluate those proposals would constitute a laboratory in which we could look at the process by which people in the buildings decide what was a reasonable cost for an improvement, and at the process we use at the central level to trade off among those things would also be interesting. If you can find a focus for that research, you have data available.

Answer: I'd like to suggest that the other presenters take a look at some of the kinds of decision areas districts face, and some of the kinds of processes at work in the schools. We've heard two or three of them here this morning. I think the program review process Beaverton has is exemplary. I think the reduction process Portland has is exemplary. I think that the program change objective concept with your program improvement, Walt, is exemplary. Those are neat ideas others could use to modify for their own use.

There are some interesting issues that came out of Colorado to help shape priorities in the time of fiscal constraint and reduction. How do you weigh different kinds of programs? How do you order them? It seems to me that those kinds of issues would be very useful to both the practitioner and the researchers.

Question: Part of what we've been looking at is the formal, comparative, cost-effectiveness study per se, doing it sort of as a set-aside, separate formal activity. What percent of the problems that you encounter represent a formal study where writing a final report would be worth the trouble and time that it would take to do it? Are we talking about half of these cases, five percent of these cases, or what?

Answer: I don't know what you mean by "these cases."

Question: You just went through a whole series of topics, under which we need to be doing better cost-analysis work. We seem to generally agree that there's a lot to be done there. Part of what we're looking at, and part of what the economists are talking about is stand-alone, formal, comparative studies of program alternatives: what the evaluators talk about when they talk about randomized field experiments in evaluation--a full-blown approach where you really need to put everything into it. One thing our program is trying to assess is what kinds of needs are out there, and for what kinds of cost work? So, for this formal, full-blown type of study, what percent of the time when you have cost problems would this kind of a study be a reasonable alternative to be considered?

Answer: Experience has indicated to me as we worked our way through an intensive review of any program that there were a number of things needed. One was time. We had to narrow down the scope of programs we would take a look at in those terms. We legitimized this by the observation that we make few fundamental changes to begin with. Most of the time we just diddle around, and life goes on, to put it in pedestrian terms. So, if we're really going to make a substantive impact, why not take the time? Why not pour the resources to it, and focus and concentrate on a particular area, which would include the kind of

cost data and comparison that we're talking about. Maybe, as a result of that, you'd make little or no change for other reasons. Nevertheless, I think it is worth narrowing the scope and attention, recognizing that you can't solve all of the questions in all of the areas, as you might need to. You may even have some short-term survival things you have to do, like cut all of the programs by two percent. You're going to do that anyway, just to stay alive. My point is that I think it useful and necessary to take time if we're talking about good, descriptive cost data, comparisons of the development of the tools, techniques and formats for displaying it, etc. It can have a substantial impact.

One of the interesting things I found is that people are hungry to pin a decision on something which is very quantifiable, and our school closing decisions would be an example of this. We have seven basic criteria of this, two of which really can be demonstratable in highly qualifiable terms. One is economics of operation, and the other has to do with demographics. After it's all said and done, the decisions are usually legitimized. The point is, the attention the people give the criteria is probably disproportionate to the credit they get in making the overall decisions. So we run that danger; that's possibly what Don was talking about. Once you get the data display and work with it, you can see it and can compare. It's just like locking at basic achievement data; you walk right in on it and forget about everything else. Frankly, that's a problem we've run into in some of these cases, where we've done a pretty decent job of breaking out the costs and comparing them.

Question: My question as to the level of cost-analysis technology and if it's worth the effort, can be compared to open heart surgery. We know tha all surgeons don't do open heart surgery, and the incidence of such surgery in normal surgical practice is not high. I'm sort of asking that kind of question about cost-effectiveness analysis. Yes, we all need to do better cost work, to use it more, etc., but how many of us really ought to be doing the formal stuff, and how many times would we use

it? Once a year, once a month? What's it worth to learn about and to do cost-analyses? It's a costly, time consuming activity.

Question: If I heard Walt correctly, the broader and more encompassing need involves display techniques for describing costs before you even think about the cost-effectiveness analysis. I'd be interested in hearing from Larry how much of his training as an economist was necessary for most of these studies, because most of them are cost description studies.

Answer: Most of them are cost-description studies, so the need for special training is limited. However, the more detailed we got into the cost description, the more the special training became necessary. The most detailed cost descriptions are Studies 1 and 1a, which are the transportation studies. The other studies, particularly the discussion of one of the two feasibility studies, come in for some severe criticism because of the nature of the cost, which is probably, at best, superficial.

Question: It seems that this is where an accountant's point of view is important.

Answer: To ascertain what the components of the costs are, yes. There are other more sophisticated issues, though, as Walt brought up. For example, the issue of opportunity costs--if we buy a computer, what are we giving up in the way of aides, textbooks, or library resources? What kind of a period of comparison do we adequately use?

Question: Nick, I think your question is, "Is cost-effectiveness analysis cost-effective?" Because of some of the things that were said today, the real question ought to be under what conditions is it cost-effective? And I heard from each of you different ideas about when it might very well be cost-effective. Zeno's first comment about instructional programming and support programs doesn't explain everything, but it was one key element. If you know something about methodologies in different areas, you know why it's easier to do cost-effectiveness studies within areas of transportation, etc. There's not a lot of disagreement about that.

The second observation is that there were a number of comments about the rationality of organizations. Comments ranged from the view that organizations may be forced to be rational by use of cost-analysis models to the view that organizations are inalterably irrational and loosely coupled. The saving grace of all that, of course, is the concept of bounded irrationality, which means there are situations in which rational models may work reasonably well. I think helpful guidance can be drawn out of what each of you suggested about the conditions under which cost-effectiveness analysis might be rooted.

I have to take issue with Walt's comment that the emphasis should be placed on the development of measures. Improving the quality of outcome measures, improving the quality of cost estimates, is a very costly activity itself and may not always be worth the effort. I agree that measurement development represents a challenge to doing cost-effectiveness analysis, but evaluations that require a large investment up front in order to even get a study off the ground may not be worth the money. Many of the things that Larry's involved in, and Don talked about, seemed to be immediately more cost-effective because they were based on readily accepted measures of outcome.

Answer: I'd like to react to the question that Nick asked. First of all, it's obvious that there is a tension between precision in an analysis versus the quick and dirty. I hope we don't ever lose the quick and dirty. I think we'd be surprised at the kind of value for us to be able to have someone go off in a corner and reflect about a problem so that the decision maker will not be bombarded by data when facing a tough decision.

Cost-effectiveness analysis is one of the instruments in our tool chest. I hope, because it has a lot of visibility and power in terms of a major or large-scale decision, we won't forget these other tools we've examined. It seems to me that one of our problems is the capacity of our managers--getting them to use the stuff once it is prepared. One of the things that came home to me in last spring's project was the fact that if people have

access to someone else's analysis, they'll borrow it and adapt it for their own use, which provides both power and efficiency.

We went around the state and ran into district after district that had a copy of the Beaverton study on buses and adopted it for their own use. We had some very small districts that typically would not be expected to conduct this kind of study, but they felt reasonably comfortable about the decisions they were making based upon the Beaverton analysis. My concern is, Can people use it? and, Do they know where to get samples? My last point is that, generally, local school systems can't handle very many analysis at a time, because of lack of staff. There must be ways we can share and stretch our resources.

Answer: Nick, you asked for percents of the need for formal cost-effectiveness analyses. I would guess that, right now, if you think of a model of district decision making, for about 5 to 15 percent of decisions we make, cost comparisons are of paramount concern. These would be situations where we're looking for the least expensive alternative, given some plan of action that comes up to minimum requirements. We have a business agenda at every board meeting every two weeks that includes a list of 100 decisions that we made, such as whether to buy this kind of aluminum coating for $28,000 versus this kind for $35,000, because it met minimum specs, or what is the least expensive way to run those buses. We know we're going to run them. We know how many kids we have to carry. We have a policy that tells all of that; we just want the cheapest way to do it.

What I would guess, though, is that if we looked at the degree which those decisions were being made, based on careful well-designed, well-planned studies of one sort or another, it would be a fraction of them. And if we looked at the percent of those in which the R&D unit of the district was an active and helpful partner or leader of the process, it would be an even smaller fraction. I think this is going to have to expand within the next five years, or else we're going to find fewer than the 800 R&D units we now have in the 16,000 school districts in the country.

The next thing I'd look at would be cost studies or decisions in which cost comparisons are significant. I would guess that that would take up the next 60 to 85 percent of the decisions we make for our board, for a total between 50 and 80 percent of the decisions. Those are things where we're looking at alternative education, or educational support programs or actions that have differing cost implications and effectiveness levels, such as our CAI study. The primary question isn't how much the CAI cost. The question is, how can we most effectively implement computers and other high technology in the schools, but we want to use cost as a prism on that.

The last thing is that there are another 15 to 35 percent of cases in which cost comparisons are not very significant. This would be a case when we're given pre-allocated funds, and we're asking which is the most effective program. The funds are pre-allocated, so the key issue here is effectiveness and not costs. These are the decisions supported more or less and that of those I'd say R&D units are probably making a larger contribution.

Answer: Despite the glory of cost-effectiveness analysis--I see little or no need for it at this time. It seems to me that if we're going to develop it, I would like to see the descriptions of costs and program effects at a building level, and that's quite different from cost and effect analysis. I think we have a big specter on the horizon, however, and this is going to come from the federal government in Circular 102, that will be followed by federal auditors in the very near future. They're going to say we should do what they call "efficiency audits," and they will do audits of financial expenditures. But they also intend to do program effects audits, and try to relate to them. I don't know how many of you have been through that kind of horrendous behavior. We did one here at the Lab. To give you an idea of how ludicrous they've become (at that time we were developing several Alaskan readers), a questionnaire was sent to all of the teachers in Washington, Oregon, Idaho, Montana and Alaska to see how many had heard about the Alaskan readers.

It was reported as part of the effectiveness that not many of the teachers had heard of them. The implementation through the auditing world of this type of audit is going to cause us tremendous problems unless we are able to have a data base to say "Here are the effects, and here are the costs" descriptively, if in no other way. Is anyone else afraid about Circular 102?

Answer: Probably that, coupled with the single audit concept, can bring us right to our knees so we can't do anything.

Question: What is a single audit?

Answer: They come in and do it all. They get you all at once--the whole pig.